South Street Bridge
Carrying South Street, spans Pennsylvania Avenue, Wilkes-Barre Boulevard , Pocono Northeast Railroad, O'Karma Terrace and South Welles Street
Wilkes-Barre
Luzerne County
Pennsylvania

HAER No. PA-105

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING REOCRD
MID-ATLANTIC REGION, NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

HAER PA. 40-WILB. 6-

HISTORIC AMERICAN ENGINEERING RECORD

SOUTH STREET BRIDGE

HAER No. PA-105

Location: In Wilkes-Barre, Luzerne County, Pennsylvania, carrying South Street from South Washington Street to Park Street above grade over Pennsylvania Avenue, Wilkes-Barre Boulevard, Pocono Northeast Railroad, O'Karma Terrace and South Welles Street.

UTM: 18.425825.4565440
Quad: Wilkes-Barre West

Date of Construction: 1924-1925.

Present Owner: Commonwealth of Pennsylvania
Department of Transportation
Transportation & Safety Building
Commonwealth Avenue and Forester Street
Harrisburg, Pennsylvania 17120

Present Use: Vehicular bridge.

Significance: The South Street Bridge is an unusual, long span metropolitan bridge comprising thirteen concrete spans and two steel truss spans. While the concrete spans are representative, the trusses are unusual examples of a nonproprietary truss type designed by John E. Greiner and fabricated by the American Bridge Company. The trusses are formed with vertical endposts, diagonals in Pratt configuration, polygonal topchords, and unusually decorative portals.

Project Information: This documentation was undertaken from November 1986 through April 1987 in accordance with a Memorandum of Agreement by the Pennsylvania Department of Transportation as a mitigation measure prior to the rehabilitation of the bridge, including removal of the trusses.

Paula A. C. Spero
Historic Structures Consultant
for Penn DOT
Baltimore, Maryland

At the time of its construction, the South Street Bridge was the largest undertaking ever attempted by the City of Wilkes-Barre. Costing over one million dollars, the structure was completed in 1925 after nearly fifteen years of planning. The 1750 feet long concrete and steel bridge was formally opened to traffic in December 1925, following a day of dedicatory celebration. As originally built, the structure consisted of fifteen spans, twelve concrete arches, one concrete beam and slab span, and two trusses. Like many metropolitan highway bridges built in the 1920's, the bridge's appearance was more than utilitarian; it featured ornamental details which reflected its importance to the residents of Wilkes-Barre. The massive concrete approach spans were highlighted with concrete pylons at both ends, ornamental light posts illuminated the length of the bridge, and cast iron ornaments embellished the trusses. The trusses, each measuring 227 feet long, were the central spans which crossed far above multiple railroad tracks. When viewed in elevation, their unusual configuration gave the bridge a distinctive appearance. Designed by John E. Greiner as nonproprietary truss types, they were erected of typical steel members in an unusual composition, with vertical endposts, diagonals in Pratt configuration, polygonal upper chords, and decorative portals.

The current South Street Bridge is the second bridge built to provide transportation between the Heights and Central sections of Wilkes-Barre. The original was a wire rope suspension bridge completed in 1873 by the Iron Bridge Association of Wilkes-Barre. It was conceived in 1870 by George Parrish and F. J. Leavenworth, members of The Iron Bridge Association, as a means for developing the land in the Heights. Much of the land was owned by the Lehigh and Wilkes-Barre Coal Company. Advertisements began to appear in local papers in 1871, offering lots for sale and describing the Heights as a "high and healthy location" with a "splendid view of the valley". To convince residents of future accessibility to these southern hills, assurance was given that the South Street Bridge would be built "next season". Parrish and Leavenworth petitioned the Borough of Wilkes-Barre in 1871 to build the promised iron bridge over the Wyoming Canal and the Lehigh and Susquehanna Valley Railroad, according to plans designed by R. R. Rothwell, a civil engineer. The cost to the Borough was $5,000, while the Iron Bridge Association would pay $25,000.00.

The wire rope suspension bridge was completed and passed the City Engineer's inspection in December 1873. Its seven spans were supported on iron bents. Carrying traffic from Lincoln Street to Pennsylvania Avenue, the suspension bridge is depicted schematically on drawing number PA-105-32. It served the Heights residents until it was closed in 1919. The old South Street Bridge proved its builders correct in their speculation for developing the Heights. By the opening of the second South Street Bridge in 1925, one-third of the city's population lived in the section of the Heights served by the bridge.

The old bridge began to exhibit problems in 1910 and the city organized a committee for building a new one. In addition to replacing the spans of

the existing bridge, it was deemed necessary to eliminate the many additional railroad grade crossings that had developed since 1871. In 1911 Torrance & Taylor, consulting engineers from New York, were appointed to prepare plans for the new bridge and grade crossing elimination. They provided the city with plans and specifications for a steel and reinforced concrete bridge in March 1911. City Engineer Bert K. Finch and City Clerk Fred Gates corresponded and met with representatives of the railroads involved and proposed a means for financing the new bridge. The cost was to be shared by the city of Wilkes-Barre and the railroads over which the grade crossings would pass. The Central Railroad Company of New Jersey, the Lehigh Valley Railroad Company, the Pennsylvania Railroad Company and the Wilkes-Barre Railway Company agreed to contribute approximately one hundred and twenty-five thousand dollars toward the construction of the bridge. Wilkes-Barre would provide one hundred and fifty thousand dollars from the sale of coupon bonds. However, opposition to the proposed South Street project was strong. The new bridge, to be built for the use of "pedestrians, wagons, other vehicles and cars propelled by electricity or other motive power" was not built because the bond issue was defeated in 1912. Instead, the old bridge was extensively rehabilitated in 1912 and kept in repair until it was closed to vehicular traffic in 1919.

The Heights residents persisted in their demands for a new bridge and the issue was reopened in 1920, when City Engineer Bert Finch reported it was "one of the most needed improvements in the city of Wilkes-Barre". By May 1922 the bridge was still closed but the City Council passed a resolution to negotiate with an engineer for the preparation of plans and specifications, as well as to reopen the negotiations for sharing costs with the railroad companies. Responses from twenty-six engineers were solicited with regard to the cost of preparing the plans and supervising construction. On October 17, 1922, City Council decided to enter into an agreement with J. E. Greiner & Company of Baltimore, Maryland.

John E. Greiner was a bridge engineer who was recognized by his peers early in his career for his contributions to the field. After graduation from the University of Delaware as a civil engineer, he began practicing his profession in 1880 at the Edgemoor Bridge Works, and continued with the Keystone Bridge Company and the Philadelphia Bridge Works. From the late 1880's to 1908, Greiner worked for the B & O Railroad. In 1908, he started his private consulting firm, a one-man company which has grown to be a diversified engineering firm, Greiner Engineering, with major projects throughout the nation. His success in private practice came rapidly. Among his bridge designs in Pennsylvania were the 1916 Harrisburg Walnut Street Viaduct, the 1917 Wyoming Valley Susquehanna River Bridge, and the 1918 Laceyville Bridge. In the 1920's, in addition to designing Wilkes-Barre's South Street Bridge, there were several concrete rainbow arch bridges in Johnstown and the monumental Soldiers' and Sailors' Bridge in Harrisburg. Other significant engineering work by Greiner's company in Pennsylvania included acting as supervising Consulting Engineer for the Pennsylvania Turnpike.

With the signing of the contract between John E. Greiner and Wilkes-Barre, the procedure for building the second South Street Bridge was finally on its way. During 1923 negotiations with the railroads concluded in agreements for shared costs among the railroads, Luzerne County and Wilkes-Barre city. In March 1923 sealed bids were opened from nine contractors for the construction of the South Street Bridge. These were referred to the City Engineer's office for study. On July 15, 1924, the contract was awarded to McLean Contracting Company of Baltimore, Maryland for $705,000.00.

Construction of the South Street Bridge began in August 1924 with excavation and pile driving for the piers. Concrete piles, ranging in length from nine feet to thirty-seven feet, were cast in place nearby at Turner's Warehouse. As the piers were completed, work progressed on forming the arches which sprang from piers 1 to 8 on the western side and piers 10 to 14 on the eastern end. The concrete for each arch was placed in balanced sections beginning at the piers, working simultaneously from both ends, and ending at the arch crown. After the concrete reached the proper strength, forms were removed and the surface was finished by grinding and rubbing, using hand and electric surfacers. Throughout the fall and early winter of 1924, the new bridge construction advanced smoothly. On December 11, 1924, workers started tearing down the railing on the old suspension bridge; it was not completely removed until a year later.

As work progressed on the concrete portions of the new South Street Bridge, fabrication of the steel truss members began at the American Bridge company plant in Elmira, New York. In January 1925, American Bridge Company workers unloaded the first shipment of steel and began erecting the falsework necessary for assembling the trusses. In February, a traveling crane was erected and the trusses began to take shape. The span between piers 9 and 10, the easternmost truss, was assembled in March and the other truss was erected in April. By April 18, American Bridge Company had completed the riveting for the steel spans; a total of 25,800 rivets were placed. All that remained was cleaning the steel and painting it.

In the summer of 1925, the superstructure of the South Street Bridge began to take its final form. More arches were completed, concrete balustrades were formed at the casting plant set up in Ryman's lumber yard, and sidewalks and curbs were formed. Spandrel walls and approach ramp wall surfaces were finished using electric bush hammers, while balustrades were finished and then polished. As the concrete work progressed in the fall of 1925, the steel spans were cleaned and painted, electrical lamps were wired, tracks were laid, and trolley wires installed for the Wilkes-Barre Railway Company. In November the approach pylons were finished and the bridge name plates were installed on them. Through November the workmen continued surface finishing, painting and clean-up work. On December 2, 1925 a preliminary inspection was made, preparatory to the bridge's formal opening on December 10.

At the time of its completion, the City Council declared that South Street Bridge was the "biggest single undertaking which the city of Wilkes-Barre has ever attempted", and that "proper dedicatory exercises" would be arranged at the opening of "this magnificent structure". The ceremony began at 3:15 p.m. with a parade which marched from City Hall, through the central city to the bridge, and over several streets on the Heights. Dedicatory speeches were given on a platform located on the bridge. The ceremony ended as Mayor Hart threw the switch to illuminate the bridge and formally opened it to traffic.

Since its opening, the eastern concrete arches, the approach ramps and the trusses of the South Street Bridge remain essentially unaltered. As originally built the bridge had two embellished monumental approach ramps, five concrete arches at the eastern approach, seven concrete arches at the western approach, one concrete beam span at the western approach, and two steel truss spans at the center. In overall configuration and attention to ornamental detail it was representative of metropolitan highway bridges built in the United States in the 1920's. The concrete arches are solid spandrel type with four arch ribs each. Deck loads are carried to the arch ribs by concrete girders and transverse cross walls. Surface ornamentation consists of simple incised lines on piers and spandrel walls. The approach demarcation consists of two simple concrete pylons. Bronze bridge name plates are attached to each pylon base. At the top of the pylons are cast ornamental cable holders. The theme of simple ornamentation is continued through the bridge decks with light standards and brackets, and truss portal ornaments. Eight cast iron ornaments were specified in the bridge plans, one for each truss endpost.

It is the trusses which distinguish this bridge. In the design of late nineteenth and twentieth century truss bridges it was common practice to choose standard, proprietary truss types from bridge company catalogs. The catalog truss was sized for the site in question, fabricated and shipped to its designation for erection. This was not the procedure used for the Wilkes-Barre bridge. Designed by Greiner and fabricated and erected by the American Bridge Company, the South Street Bridge trusses do not conform strictly to the configuration of the common proprietary truss types typically used for American highway bridges. The vertical endposts, diagonals in Pratt configuration, and polygonal top chords constitute an unusual truss form. These trusses represent one of the two known examples of vertical endpost through truss bridges surveyed during Pennsylvania's historic highway bridge inventory. The South Street Bridge trusses have maintained their configuration as originally designed and built, with only minor alterations to a few members in 1941. All cast iron ornaments are intact. The individual truss member configuration is typical of truss bridges of that era, consisting of built-up members made of angles, channels, plates and lacing. Other structural features of the trusses include riveted connections and floorbeam stringer deck systems.

The concrete portion of the South Street Bridge was altered significantly in 1947. As originally constructed, there were seven arches and one concrete beam span on the western end, and five arches on the eastern end. In 1947 the seven arches on the western end were removed and replaced with steel girder spans. The piers on that side of the bridge, as well as the concrete beam span, appear to remain in their original condition, although they have deteriorated.

The concrete approach ramps to the South Street Bridge have not been altered since they were built. In overall appearance, both in mass and configuration, the approaches are monumental in character. The scale and shape of the approaches, particularly the curvilinear western approach ramp, is especially handsome. They are massive, although not out of scale with the rest of the bridge, and consist of gravity retaining walls and counterfort retaining walls. Surface ornamentation is like that of the piers and arches.

It has been determined that the concrete portion of the South Street Bridge will be rehabilitated. The two truss spans will be removed and replaced by a new structure.

BIBLIOGRAPHY

Atlas of Luzerne County, Pennsylvania, Philadelphia, A. Pomery & Co., 1873.

Bradsby, Henry C., editor, History of Luzerne County, Pennsylvania, Chicago, J. B. Nelson and Company, 1893.

Bridge Files, 1910-1925, City Engineer's Office, Wilkes-Barre City Hall, Wilkes-Barre City Hall, Wilkes-Barre, Pa.

Bridge files, Osterhout Free Library, Wilkes-Barre, Pennsylvania.

Hanlon, Edward F., The Wyoming Valley, Woodland Hills, California, Windsor Publications, 1983.

History of Luzerne, Lackawanna and Wyoming Counties, New York, W. W. Monsell and Co., 1880.

Log of the South Street Bridge: 1924-1925, City Engineer's Office, Wilkes-Barre City Hall, Wilkes-Barre, Pennsylvania.

Minute Books, Wilkes-Barre City Council, 1871-1947, Wilkes-Barre City Hall, Wilkes-Barre, Pa.

Newspaper files, "The Luzerne Union", 1871-1875, Wyoming Valley Historical Society, Wilkes-Barre, Pa.

Newspaper files, "The Weekly Union", 1871-1877, Wyoming Valley Historical Society, Wilkes-Barre, Pa.

Roe's Atlas of the City of Wilkes-Barre, Luzerne County, Pennsylvania, Pennsylvania, Philadelphia, F. B. Roe, 1882.

Sturdevant, W. H., Atlas of the City of Wilkes-Barre, Pennsylvania, Philadelphia, J. L. Smith, 1904.

SOUTH STREET BRIDGE
HAER No. PA-105 (Page 8)
Site Plan